Dear Editor,

All comments suggestions from you and Referee #1 have been assessed and included in the revised manuscript.

Please find below the response to the Referee #1's comments (in bold her comments and italic the authors' replies).

Many thanks and best regards,

Omaira García et al.

Response to Referee#1

Minor comments

I would like to thank the authors for the additional work they performed for this updated manuscript, especially concerning the Appendix A on the uncertainties linked to the H2O interferences. However, I would conclude differently (or at least be more nuanced) in the Appendix A (and therefore in the summary and Conclusions section). Indeed, looking at Fig A1, we see: - The theoretical H2O uncertainties in the range of slant column of IZO (so in the range where we can verify it), are very small and similar for one-step / two-step (when no temperature retrieval). And even (unexpectedly?) smaller with 1000 set-up in the one-step approach. (when temperature is retrieved, we can question the theoretical results since they give higher theoretical H2O error, while the empirical ones are smaller.) - The empirical verification (comparisons with Brewer) shows no improvement at all (even worse for the 1000T) when using the two-step approach, when the instrument is stable (2008-20018). And the improvement for the period 2005-2008 is small (0.01-0.02%). So, I would conclude from Appendix A that both approaches are valid to correctly take into account the H2O interferences.

The author agree with the Referee and conclusions regarding the one- and two-steps retrieval strategies have been modified following the Referee's suggestions as follows:

In Appendix A: "One-step and two-step approaches provide consistent results when the simultaneous temperature fit is not included for all set-ups and, therefore, both can be valid to correctly minimize the H2O interference. Nonetheless, provided the documented improvement of the temperature retrieval is pursued, the two-step strategy ought to be used. In this sense, the two-step strategy drastically reduces the H2O interfering error for those set-ups using narrow micro-windows when the simultaneous temperature fit is included (4MWsT/5MWsT), leading to expected errors on the O3 total columns smaller than 0.01%. The H2O interfering effect also drops for the 1000 spectral region, but to a lesser extent, given the presence of important H2O absorption lines in that region (recall Figure 1). This should be especially taken into account for FTIR stations located in humid environments.

The comparison to Brewer observations (Figure A1 (c) and (d)) also corroborates the theoretical results. It is worth highlighting the fact that the differences found between the two strategies are in excellent agreement with the estimated H2O interfering error values (Figure A1 (a) and (b))."

In Conclusions: "In this sense, using one-step or two-step retrieval strategies (retrieving H2O and O3 in the same or in two separated steps, respectively) has been found to be valid and provide consistent results."

Another remark for the Summary-Conclusion Section: There is indeed no doubt that the narrow micro-windows (and T retrieval with stable instrument) set-up has been proven better by the authors, in terms of O3 total column precision,. But it's worth mentioning in the conclusions (as it has been said in the text), that this is not the case for the O3 profiles' precision, depending on the altitude range that is considered.

The following statement has been included in the Conclusion:

Regarding the vertical O3 distribution, the important cross-interference between the O3 and temperature profiles, and the instrumental status results in a differentiated performance of the set-ups depending on the altitude range. The best overall performance is documented for the set-ups using narrow micro-windows and simultaneous temperature fits in the troposphere and stratosphere regions, while in the tropopause altitudes the broad micro-window strategy seems to provide the best agreement with respect to ozonosonde data.

Technical comments:

- Figure 3 b) and c): I do not see the TE 1000, TE 4MWs, and TE 5MWS lines: is it because they are covered by other lines or are they missing?

Indeed these TE errors are included in Figure 3, but they are covered by the other lines (they can be slightly distinguished at low ozone slant columns).

- P. 14, l. 348: "Including o not this fit…": the "r" is missing

Corrected

- P. 15, l. 355-356: "and instrument status": we do not understand this conclusion here. I guess this is because in the AMTD version, the authors said that the situation is different with bruker HR vs Bruker M, but here it has been removed. So ?

The Referee is right. This statement has been modified as follows: "This result further corroborates that the broad region seems to be less sensitive to the improvement generated by the temperature retrieval."

- P. 21 l. 469: NDACC not NADCC

Corrected